Pbar Measurements with Prototype BPM Equipment in MI-30

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Manfred and I looked at pbar signals in MI during shots to Recycler this morning, Friday, Sept. 16. Analog signals were processed in Manfred's prototype transition board. Transition board outputs were split into two EchoTeks, although during these tests one of the signals to the second EchoTek board was connected instead to the oscilloscope. The EchoTeks were configured in narrowband, around 1KHz, 2.5 MHz mode.

Figure 1 shows the intensity in the Accumulator as the five transfers that were made.

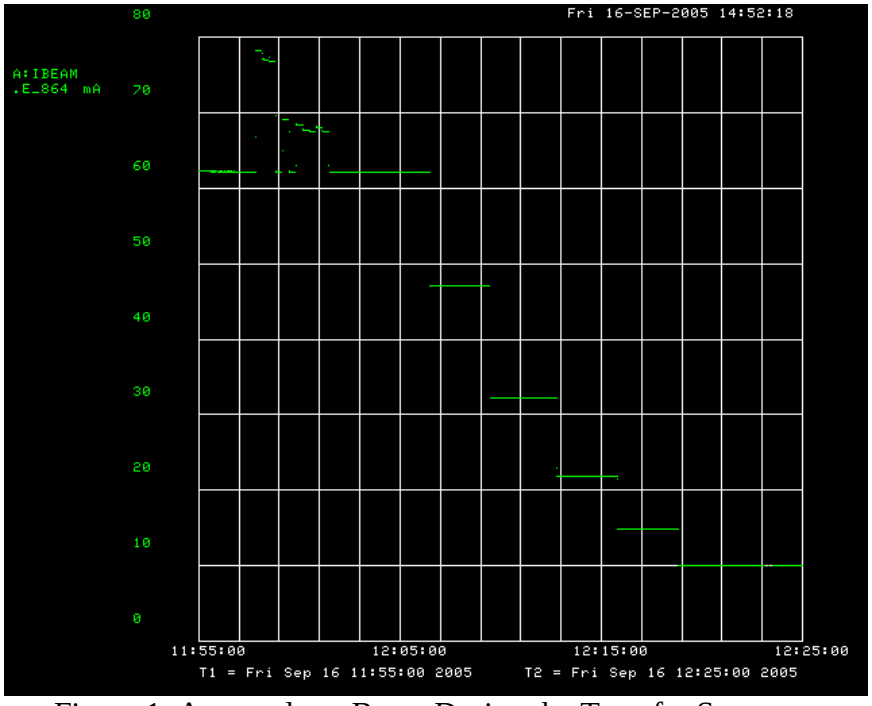

Figure 1. Accumulator Beam During the Transfer Sequence

The first transfer, about 15E10, is shown in Figure 2. The plot traces are I:IBEAM, the Main Injector beam current signal, Z:HP031, the measured beam position, and Z:HI301, the BPM sum signal. We did not obtain scope trace for this transfer because our scope trigger was set too early.

The second transfer, about 15E10, is shown in Figure 3. A plot of the scope data from this transfer is shown in Figure 4. The scope signal is small because the 2.5MHz gain on the transition board was set quite low.

The third transfer, about 10E10, is shown in Figure 5 and the scope data is in Figure 6. The transition module 2.5MHz channel gain was increased by an un-calibrated amount between transfers 2 and 3.

Transfer number four, about 7E10, is shown in Figures 7 and 8.

The fifth and final transfer, about 5E10, is shown in Figures 9 and 10.

After the transfers were completed, we determined that the slow background signal bump observed in the scope data occurred at a repetition rate of about 60 KHz, even when no beam was present in the machine. The signal repetition rate was not the MI revolution frequency. That signal vanished when the transition board input cables were disconnected.

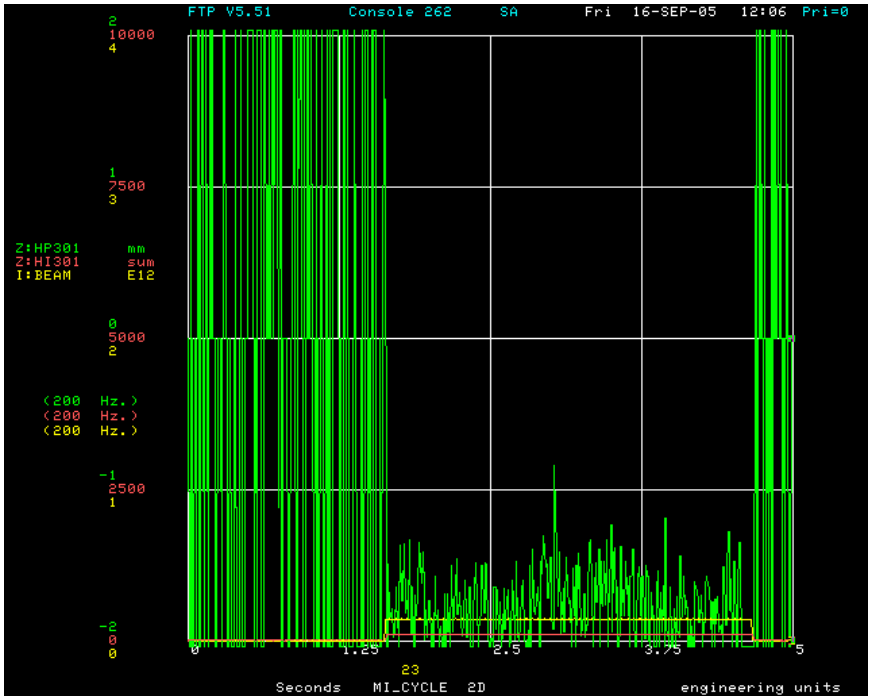

Figure 2. Transfer #1

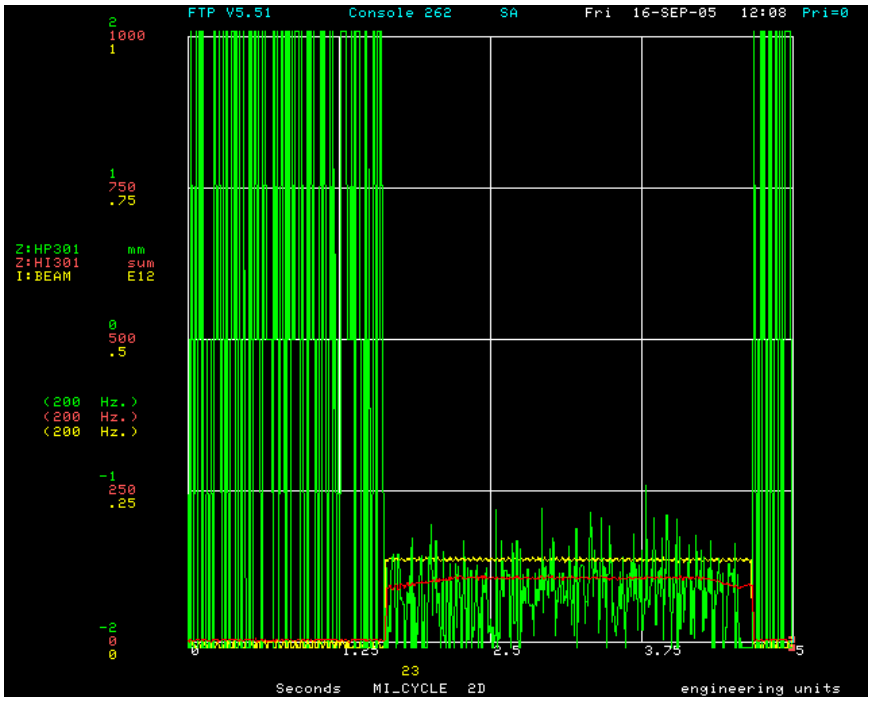

Figure 3. Transfer #2

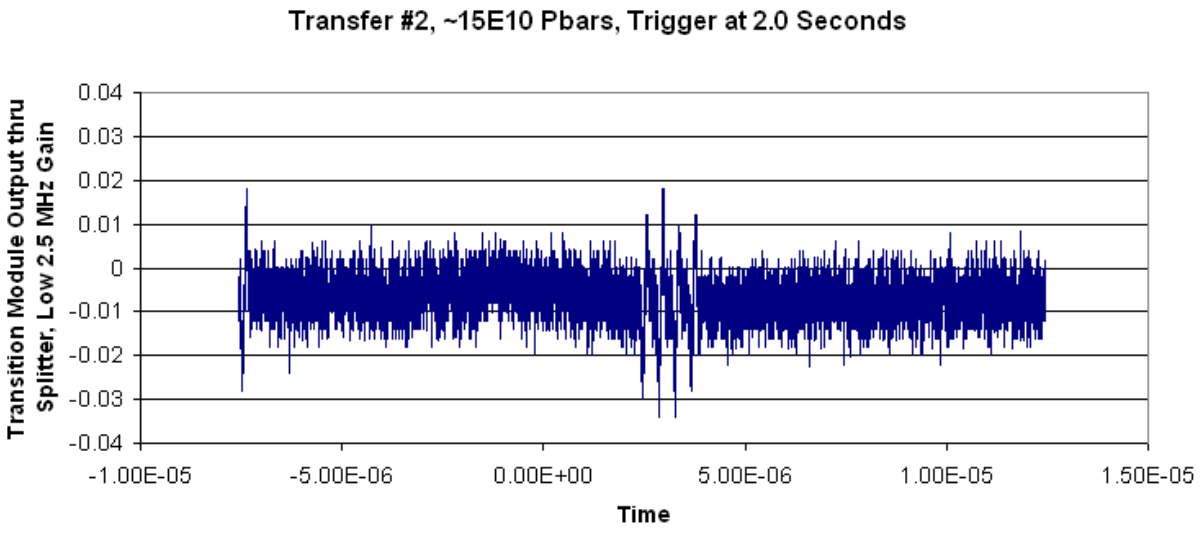

Figure 4. Scope data of transition board output from Transfer #2.

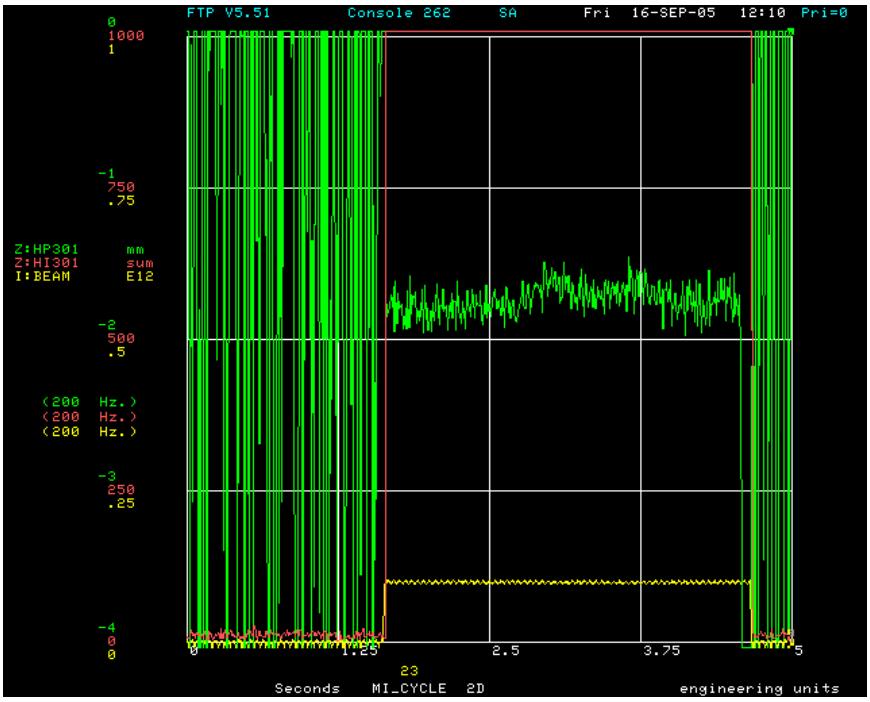

Figure 5. Transfer #3

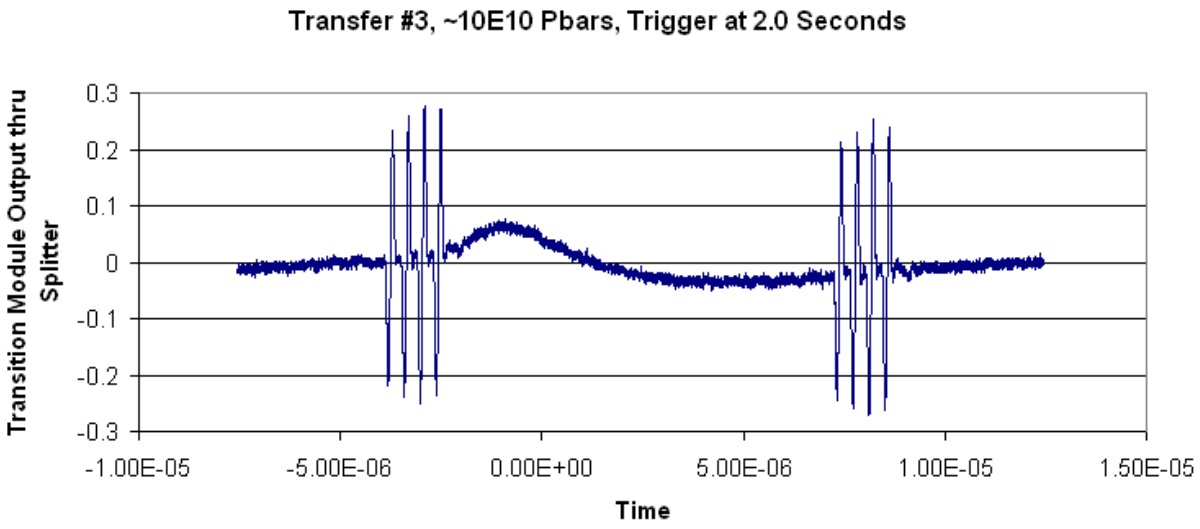

Figure 6. Scope data of transition board output from Transfer #3.

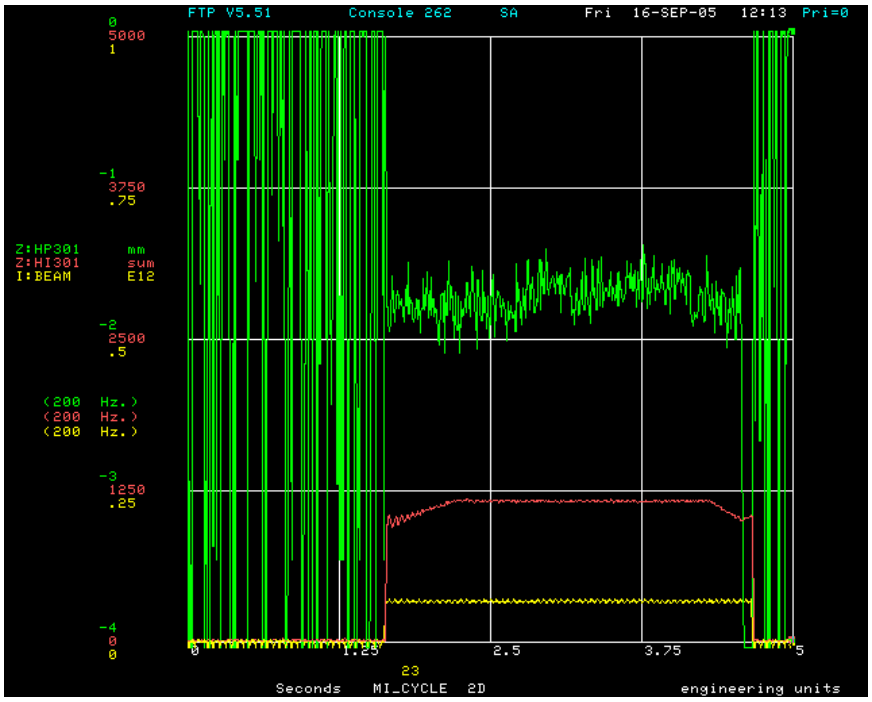

Figure 7. Transfer #4

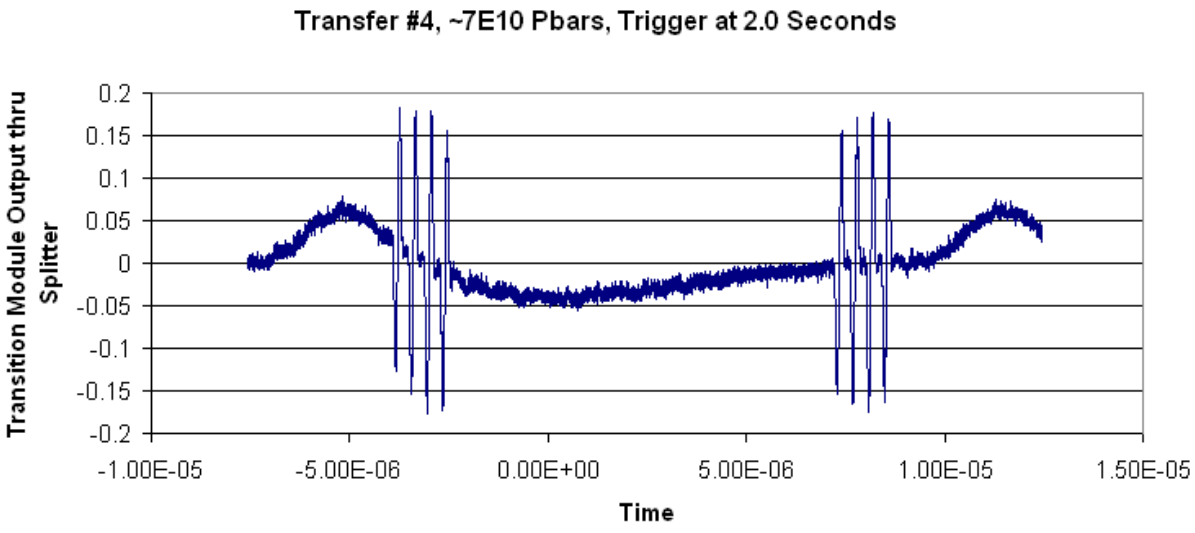

Figure 8. Scope data of transition board output from Transfer #4.

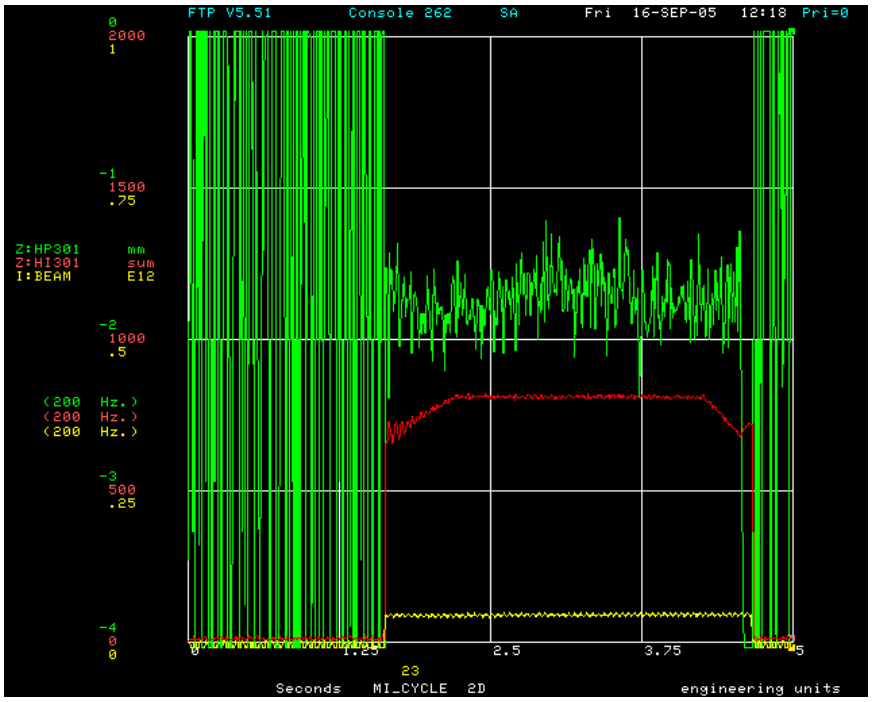

Figure 9. Transfer #5

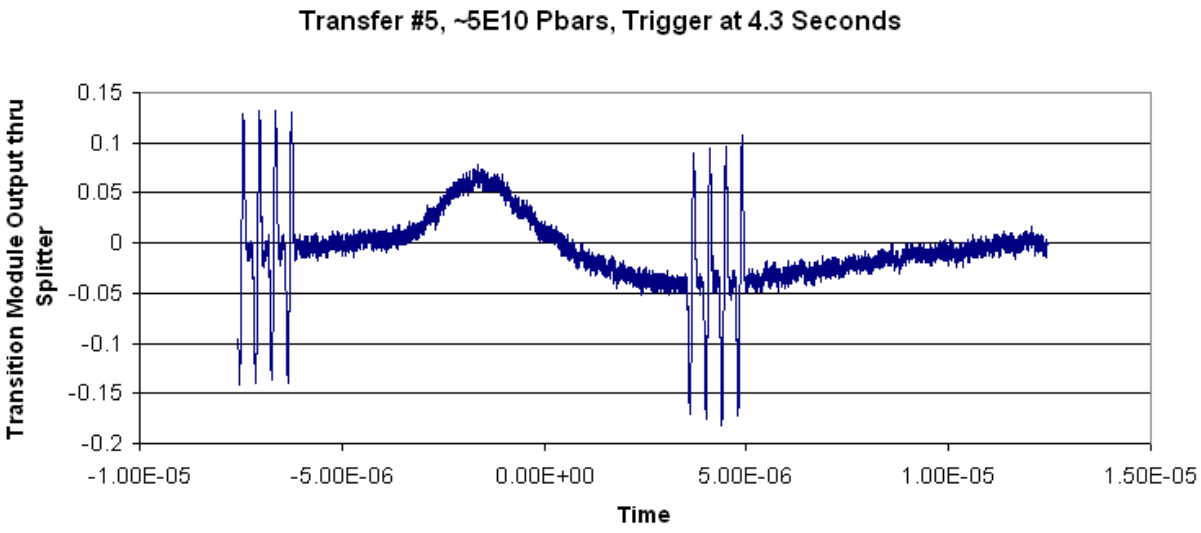

Figure 10. Scope data of transition board output from Transfer #5.